

Scoring in the Big Time

Twenty billion quarters a year are the payoff for creativity and applied high technology

By David E. Simpson/Assistant Editor

Twenty billion quarters are an awful lot of coins. This figure represents more than the entire quarter dollar production of the United States' mints from 1793 to 1981. And yet, estimates of the amount spent in 1981 on commercial video games range upward from \$5 billion, a figure that surpasses the annual incomes for both the movie and record industries.

What makes this \$5 billion figure even more impressive is that commercial video games have only been around for 10 years. The start of the U.S. commercial video game industry can be traced back only to 1972, when Atari was founded by Nolan Bushnell. Atari marketed *Pong*, a relatively simple game that featured a paddle and a ricocheting ball. This commercial video game did well for a few months in 1973, then faded.

It was 5 years before the next hit came along. In 1978, *Space Invader* was created by Japan's Taito Corporation and licensed to Bally Manufacturing Corporation's Midway Manufacturing Company. The game featured an attacking horde of aliens which a player had to shoot down before his man was shot by the aliens. Tempo increased as play progressed, making it increasingly difficult to continue.

This game set the scene for the current popularity of space theme games. In addition, the principle it demonstrated of making the game more difficult, and thus more challenging, as play progressed has become an integral component of current games.

Following *Space Invaders'* success, commercial video games have hit the big time. They can be found in many convenience stores, bars, and restaurants. Arcades featuring mostly video games have been springing up in many communities. Games such as Atari's *Astroids*, Midway's *Pac-Man*, and Williams Electronics' *Defender* have become household words.

From the player's standpoint the games are accepted because they are fun to play. Getting a large number of players to reach that conclusion, though, is no easy task for game manufacturers.

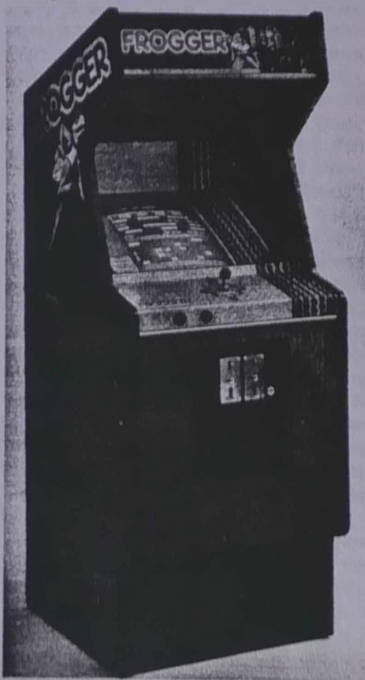
One ingredient the manufacturer must have in a successful game is a good game concept, or program. The program should establish a compact environment that can provide excitement and a challenge to a player; a world in which he can lose himself. In addition, the best games are those in which the player improves with practice, but which he cannot beat.

To date, many of the game programs, including such successes as *Space Invaders* and *Pac-Man*, come from Japan. A large part of the rea-

son for this is that the Japanese commercial video game market peaked before the American market, and the Japanese had game programs available at the time the U.S. market was looking for them. Several U.S. manufacturers have entered the video game market with games licensed from Japanese companies.

U.S. manufacturers today, though, are increasingly designing their own games. Doing this reduces their dependence on outside sources, and opens up the possibility of licensing their games to other companies.

A specific problem that could arise from dependence on Japanese licenses is that there could be fewer licenses available in the future, since



With Sega/Gremlin's *Frogger* computer video game (above and left), players meet challenges from a frog's-eye point of view. Players race the clock as they attempt to guide, in succession, intrepid frogs safely across a busy four lane highway and treacherous river to their abodes. Along the way, frogs must dodge whizzing cars and hop aboard swimming turtles and floating logs. The pace of highway traffic accelerates with each successive round, and deadly snakes, otters, crocodiles, and diving turtles appear to imperil *Frogger's* progress.



Two rocket ships fuse into a space station and venture together into deep space to do battle with wave after wave of kaleidoscopic enemies in *Space Duel*, a coin-operated video game introduced in February by Atari. *Space Duel* features the company's QuadraScan color X-Y video display system thrusting the player into a realistic three dimensional universe filled with countless waves of geometrically shaped enemies: lethal flying saucers, explosive mines which pursue their attacker, refusing to be destroyed, spinning paddles, whirling cubes and pentagons, octahedrons, and even a rash of nuclear hexagons.

some Japanese firms are considering marketing their own games instead of licensing them. Already some export to the U.S. (Nintendo, for instance, has been successful with its *Donkey Kong* game), or are considering setting up U.S. manufacturing (Namco and Universal Company both are reportedly eyeing California manufacturing facilities).

In-House Games

Williams Electronics is among U.S. manufacturers spending the large amounts needed for original research and development. It is unusual, though, in scoring a major success with its first effort, *Defender*. This game, introduced in 1980, is one of the most complex on the market. The game adds an unusual dimension by requiring the player to not only protect his spaceship from a variety of hostile villains, but to also defend 10

humanoids on a planet's surface. Another unusual feature is a scanner on the monitor to give the player a different perspective of the field.

Game Plan, a manufacturer of slot machines and pinball games as well as video games, introduced its first original video game in late 1981. "Everything from hardware to software has been created by our in-house engineering group," boasts Director of Marketing Ken Anderson, about its *Kaos* video game. *Kaos* has a vertical maze that features a little man chasing dollars. If the man does not catch the dollars, they turn into dragons and chase the man. The man can become a king and slay the dragons. Gathering dollars and slaying dragons builds points.

Stern Electronics, founded in 1976 with the assets of the bankrupt Chicago Dynamic Industries amusement games company, began producing licensed video games in July 1980. Later that year it introduced an in-house designed game, *Berzerk*. The game hardware includes logic boards in an accessible pullout drawer; the boards are designed to be interchangeable with those of later Stern video games. The game includes a self-diagnostic programming routine. A battery backup RAM enables the game to store and display the top five scores.

Berzerk includes a 30-word vocabulary, which allows the game to challenge the player to "stay and fight like a robot," and warn of an "intruder alert." To entice passersby, the game broadcasts "coins detected in pockets" at timed intervals. In the game itself, the player must avoid a robot attack through a maze.

Even Taito America Corporation, a wholly owned subsidiary of Japan's Taito Corporation, has taken an independent route. This Chicago area firm's *Qix* (pronounced kicks) game is its first in-house designed and manufactured game; others are in different stages of development.

Rather than following the more common shoot-em-up or chase scenarios, the game's object is to box *Qix*, a spinning helix, by drawing boxes of color to fill 75 percent of the screen. Bonus points are awarded for portions of the screen filled over 75 percent.

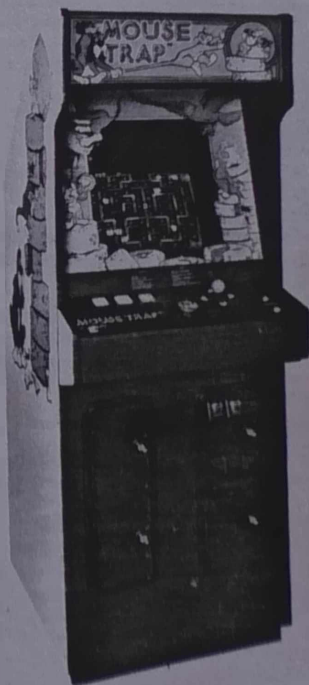
Taito's president, Jack Mittel, feels strongly about not being over-dependent on licensed games. "In my opinion, the industry is going to go through a tremendous shakeout in 1982. Those companies that are fully dependent on offshore games will, in my opinion, eventually find that market drying up and being in severe trouble. They simply run the risk of closing their manufacturing

facilities for lack of product.

"Many of the foreign licensing companies are asking American manufacturers to take games, pay them a large royalty, big numbers, without a location test. Should any of the smaller undercapitalized companies guess incorrectly they run the risk of being unable to handle their indebtedness."

California-based Exidy produces its own games, licensing them in Japan, and marketing them in Europe through Exidy Ireland. "It's not practical to sell U.S.-made games in the European Economic Community (EEC) because of trade restrictions, high transportation costs, and the lengthy transit time," reports Lila Zinter, director of marketing. "Therefore, to enter the European market we set up manufacturing within the EEC, in Ireland.

"Now we don't have to be concerned about restrictions on entry of



Players of Exidy's *Mousetrap* guide a mouse around a playfield full of pieces of cheese, which the mouse chomps for points. Other red prizes offer bonus value. The mouse also searches out dog bones which are accumulated at the top of the screen. Each bone allows the mouse to become a ferocious dog for several seconds when the dog button on the control panel is pressed. The dog can eat cats for additional points. When all the cheese rewards are gobbed up, bonus points are awarded and the player is given another game field with more challenges.

non-EEC-made games. Of course, we must obtain approval of our electronics by the various European national approval agencies. This is not, however, as difficult as you might think considering the number of new games being introduced. Since the hardware remains basically the same from game to game, once we have obtained electrical approval for a game in a given country, that approval can be carried over to subsequent games we introduce."

Atari has probably been the most successful U.S. video game designer and manufacturer. Its *Astroids* has been one of the top games in the nation since 1980. In it, a player's spaceship must shoot and destroy asteroids as they advance at it from all sides. For variety, an occasional unfriendly spaceship that fires back flies across the screen. The game is one of the first to allow top scoring players to record their initials with their scores on the screen for subsequent players to see.

High Technology

Astroids is unusual in that it is played on a black-and-white monitor. This monitor is of the new, high resolution X-Y type; as such it represents

Here workers at Taito America's Elk Grove Village, IL, facility ready its Qix game for distribution.



another ingredient in a successful game: the use of applied high technology. Line drawings are especially effective with this type of monitor. Games with color X-Y display screens are also being marketed—Atari's are *Tempest* and *Space Duel*.

Development of a new type of screen is but one in a series of hardware developments. Some are aimed directly at enhancing player enjoyment, such as the X-Y video display, high resolution raster video displays, and better audio.

Others are aimed more directly at the purchasers and leasers of the games, who are, after all, essential to any game's success. Some games feature full self-diagnostic testing modes, and front entry servicing. In addition, smaller, less expensive-than-standard upright cabinets, and games that can double as restaurant tables have been developed.

Another innovation that may become more important in the U.S. in coming years is the convertible game. Because of the short period of popularity of each video game (successful games may not keep player interest over a year) the game owner is frequently faced with trading in the game for a fraction of its original cost and buying a new hot game at full price.

One route that can be taken to overcome this expensive problem is to use hardware that will take replaceable cassettes and key modules. This way, when a game is changed, the cabinet is retained. Data East offers one such cassette system.

An alternative is to use something along the lines of Sega/Gremlin's Convert-a-Game system. This system, announced in the middle of last year, is part of the hardware of various Sega/Gremlin games. The system is reportedly capable of accommodating so-far-unrealized levels of sophisticated play.

The system is modular in design and houses a card cage with printed circuit boards—a central processing unit, memory (which holds the game program), video board, video background board, and sound and speech boards. Conversion reportedly takes 10 to 15 minutes.

According to Sega/Gremlin's example, a new game might cost \$2,800, less \$800 for trade-in of an older game. Alternately, converting an existing older game might cost \$1,000, or half the cost of trading in the old game. "Convert-a-Game is a concept whose time has come," says Sega Enterprises' Chairman and Chief Executive Officer David Rosen.

Glossary of Terms

Clock—Element of a computer which insures that all events occur at exactly the right time.

Cockpit Model Video Game—A computer video game which is operated by a player seated in a semienclosed compartment which creates a more stimulating environment of sight, sound, and play action.

Cocktail Table Video Game—A computer video game encased in a cocktail-type table to accommodate seated players.

Computer Chip—Miniaturized electronic circuit which reduces a computer's central processing unit to an extremely small size.

Hardware—Hard-wired electronic components contained on printed circuit boards.

Input Port—Circuitry which allows the computer to respond to externally generated input such as the player controls, the coin mechanism sensor, and other inputs not related to game play.

Memory—These components store game instructions in Erasable Programmable Read-Only Memory (EPROM) and Random Access Memory (RAM). RAMs store temporary information (including video) which changes during play of the game. EPROMs store permanent memory information such as the computer program for the game.

Microprocessor—Central comput-

ing unit of a computer that controls all data to and from memory and input and output ports, and performs all arithmetic and computer functions.

Output Port—Circuitry which allows the computer to control external devices such as sound and lights.

Raster Video Monitor—Commonly found in computer video games, a raster monitor is the standard video display device found in all television sets. Raster monitors can be black and white or color.

Software—The set of computer program procedures and selected documentation which determines game play sequence.

Speech Synthesizer—A device which generates an electronically simulated human voice.

Standard Upright Video Game—A conventional sized commercial computer video game which is played by a person(s) in a standing position.

Video Output Circuit—Transmits game data to the video monitor, either a raster monitor or X-Y monitor.

X-Y Video Monitor—A video monitor which provides for the display of images through the use of lines (or vectors) rather than the dot patterns used in a raster monitor. X-Y monitors can be black and white or color.

Courtesy of Sega Enterprises, Inc.

Another type of hardware aims at defeating or delaying the villains of the industry—game copiers. Copiers duplicate game programs at a fraction of the cost of game development, so can offer copies for several hundred dollars less than the originals. Often the electronics are produced overseas and imported into the U.S., where the games are assembled.

However, the effectiveness of any hardware designed to deter copying is questioned by Sega Enterprises' spokesman Bob Rosenbaum. "There is no copy-proof game. Each manufacturer has his own security devices on his games, but as long as people can play the game and learn it, they can develop their own hardware and program it themselves without tampering with the original game. The best way of combating this kind of copying is to come out with innovative new games using more advanced technology, which, most importantly, serve to maintain

player interest."

Midway has taken a highly visible approach to combating copiers. A full page advertisement in an industry publication late last year warned of copyright infringement, and said Midway intended to seek criminal prosecution against companies in willful infringement of its copyrights. It also stated it was going to continue to work with the U.S. Customs Service and the International Trade Commission, and to continue its civil suits against those who "undermine the creativity which is essential to the industry."

According to Taito's Mittel, his company is vigorously enforcing its copyrights. "We are putting a lot of money into this; we are currently staffing a special legal department to do nothing but enforce copyright protection. It costs us substantial monies totalling almost a half million dollars, just to get one game from the drawing board to the product stage. I intend to see that no one steals our games."

Enforcement in the U.S. has been aided by an appeals court ruling made in New York earlier this year. The court ruled that the sound and appearance of video games can be copyrighted. "It's a very, very significant ruling for our industry," says Midway's Director of Sales Larry Berke, "It should help us protect our copyrights in court."

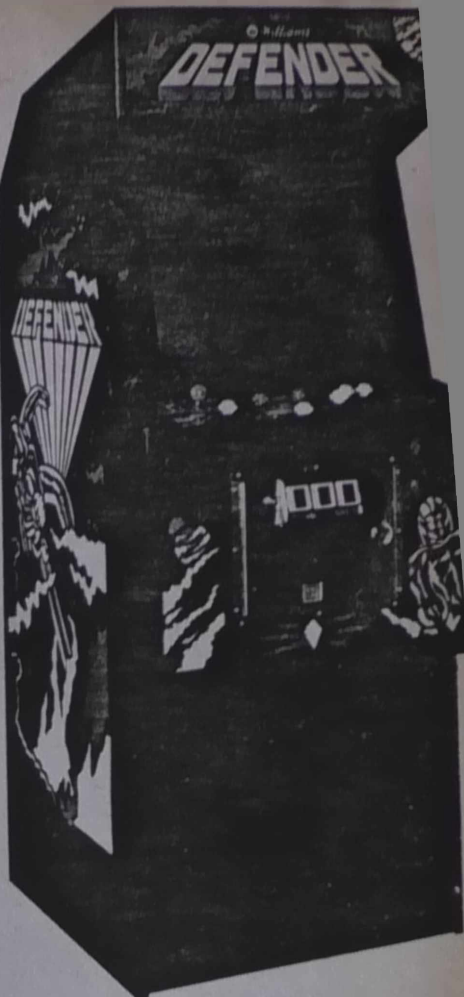
Here Today, Gone Tomorrow?

Manufacturers have to be concerned about where the market is heading. After 10 years of growth, market saturation appears imminent, with approximately 700,000 games in place. What does this mean to the industry? Will the rapid growth be followed by an equally rapid decline?

"Video games are not a here today, gone tomorrow phenomenon," asserts Atari Vice President Don Osborne. "Games are a part of human nature, and have been played since the earliest humans. With the development of good new game concepts, coupled with better graphics, higher resolution screens, better audio, and other technical developments, we look forward to continued moderate growth for the industry."

Says Sega Enterprises' Rosen, "It is eminently clear that computer video games are a sign of the times. By that I mean the games are truly one of the early manifestations of an electronic revolution whose technology will personally touch, on an increasing basis, all of our lives."

"As the age of technology unfolds before us making deeper and deeper inroads into the ways we conduct our



Williams Electronics called its *Defender* the most advanced video game ever created when it was introduced in 1980. The mission of the player's spaceship is to protect stranded humanoids on a planet's surface from alien abductors. If a player is fast enough with his rocket button, he can destroy aliens before they pick up his humanoids. Once the humanoids are kidnapped, he must destroy the abductors and pick up the humanoids before they fall to their deaths on the planet's surface. If the humanoids are successfully abducted, they mutate and become part of the enemy force, which includes such villains as *Swarms*, *Pods*, *Bombers*, *Baiters*, and *Landers*. If all the humanoids are successfully abducted, the planet blows up.



The object of Stern Electronics' *Scramble* game, introduced in 1981, is for the player to navigate his aircraft through enemy territory and successfully penetrate five *Scramble* defense systems, then reach and destroy the enemy base. The level of difficulty increases after penetration of each defense system. An additional aircraft is awarded the player at a designated score.

daily lives, I cannot envision, nor is there reason to believe, that computer video games will be a passing fad. Quite the contrary, the signposts suggest a trend toward greater acceptance of present and future models of computer video games as space age forms of electronic entertainment."